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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/526,218	03/01/2005	Hiroya Takaya	2004-1595A	8196

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SUITE 800
WASHINGTON, DC 20006-1021

EXAMINER

KIM, TAE JUN

ART UNIT	PAPER NUMBER
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3746

MAIL DATE	DELIVERY MODE
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10/30/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/526,218

Applicant(s)

TAKAYA ET AL.

Examiner

Ted Kim

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 October 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 6-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 6-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 10/19/2007.

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application.
- 6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10/19/2007 has been entered.

Claim Objections

2. Claims 6, 14 are objected to because of the following informalities: claim 6, 3rd line from the end references "the other end" whereas previously "another end" on the 4th line from the end was used. Also, claim 14, 2nd line the same inconsistency occurs. Consistency is required. Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 13, 15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

- “said protrusions” and “the protrusions” and variations thereof lack proper antecedent basis as claim 7 does not provide any indication of protrusions in that claim.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

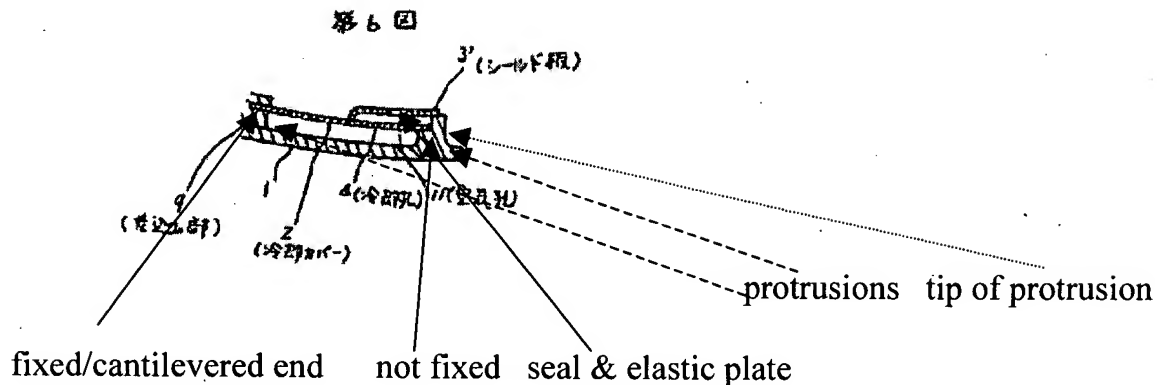
A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 6, 7, 11, 14, 15 are rejected under 35 U.S.C. 102(b) as being anticipated by JP 63-80021. JP ‘021 teaches a cooling construction of a transition piece of a gas turbine, wherein: two protrusions are mounted on said transition piece orthogonally to a main stream direction of said transition piece on a gas turbine inside diameter side thereof and adjacent to an outlet portion of said transition piece; and a plate 2 having a plurality of holes is installed between said two protrusions, said plate having one end thereof fixed to one of said protrusions (near 9) and having another end thereof unfixed to, but kept in contact with, the other of said protrusions, the other end of said plate making contact with the other of said protrusions between a tip end of said other of the protrusions and said transition piece. A cooling construction of a transition piece of a gas turbine, wherein: an impingement-cooling plate is fixed at one end thereof in a cantilever state (near 9) adjacent to an outlet portion of said transition piece on a gas turbine inside diameter side of said transition piece (note that the same sealing structure is used on the outside

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diameter side and the inside diameter side of the transition piece, see Figs. 4, 5 for evidence), said impingement cooling plate having an other end which is not fixed (near 3') and forms a gap with said transition piece; and a seal 3' seals said gap between the other end of said impingement-cooling plate and said transition piece, said seal comprising an elastic plate 3' having another end thereof unfixed to, but kept in contact with, the other of said protrusions, the other end of said plate making contact with the other of said protrusions between a tip end of said other of the protrusions and said transition piece; two protrusions are mounted on said transition piece orthogonally to a main stream direction of said transition piece adjacent to an outlet portion of said transition piece on a gas turbine inside diameter side of said transition piece; said impingement-cooling plate 2 is provided between said protrusions; said impingement-cooling plate is fixed, at one end thereof in a cantilever state, to one of said protrusions; and said elastic plate 3' has one end thereof connected to the other of said protrusions and has another end thereof kept in contact with said impingement-cooling plate 2 to support said impingement-cooling plate; wherein, between said transition piece and said impingement-cooling plate, wherein the other end of said plate, making contact with the other of the protrusions, is elastically biased in a direction orthogonal to the main stream direction of said transition piece; wherein the other end of said plate, making contact with the other of the protrusions, is held in a direction orthogonal to the main stream direction of said transition piece by an elastic force of said elastic plate.



Note that the left fixed end, as illustrated, requires that the plate 2 be inserted into the left end. Accordingly the right end cannot be fixed, due to the presence of the shield plate 3' which would block any further fixing steps from occurring.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 6, 7, 11, 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over by JP 63-80021 and optionally Andersen et al (4,010,531). JP '021 illustrates that the left fixed end, as illustrated, requires that the plate 2 be inserted into the left end. Accordingly the right end cannot be fixed, due to the presence of the shield plate 3' which would block any further fixing steps from occurring. Alternately, it would have been obvious to one of ordinary skill in the art to employ the fixed end and unfixed end,

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in the manner described above, due to the presence of the seal plate 3' blocking fixing of the right end. Furthermore, the seal 3' being an elastic plate is regarded as inherent or present, but untranslated. The plate would even appear to be made of a sheet metal which is inherently elastic. Alternately, in case there is any doubt, it would have been obvious to one of ordinary skill in the art to make the plate 3' elastic, or of a material such as sheet metal which is elastic, in order to better accommodate thermal expansion or facilitate ease of construction. Then the following limitations would be met: the other end of said plate, making contact with the other of the protrusions, is elastically biased in a direction orthogonal to the main stream direction of said transition piece; wherein the other end of said plate, making contact with the other of the protrusions, is held in a direction orthogonal to the main stream direction of said transition piece by an elastic force of said elastic plate. For an alternate treatment of the fixed end and other end unfixed, Andersen teach using a perforated cooling plate 38 (see Fig. 1) of a gas turbine component, which is supported on one end by a protrusion 29, 27 by which it is fixed/brazed and the other end of which is freely supported at 32. Not brazing the other end facilitates ease of assembly by reducing the number of brazing operations needed. It would have been obvious to one of ordinary skill in the art to make one end fixed and the other end freely supported as taught by Andersen, in order to facilitate an equivalent connection assembly and/or for ease of assembly. As for the claim 13, note Fig. 6 does not show the other of said protrusions is provided on a combustion gas upstream side of the one of said protrusions, and the other of said protrusions has a shape of a brim

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extending toward the gas turbine inside diameter side. However Fig. 4 teaches it is equivalent to use the opposite configuration where the other of said protrusions is provided on a combustion gas upstream side of the one of said protrusions, and the other of said protrusions has a shape of a brim extending toward the gas turbine inside diameter side. It would have been obvious to modify Fig. 6 in view of Fig. 4, to use the arrangement where the other of said protrusions is provided on a combustion gas upstream side of the one of said protrusions, and the other of said protrusions has a shape of a brim extending toward the gas turbine inside diameter side, in order to employ an equivalent configuration used in the art.

9. Claims 6, 7, 11, 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 2003-065071 in view of any of JP 63-080021 of the IDS, JP 62-288328 and/or also in combination with Anderson (4,010,531). JP '071 teaches a cooling construction of a transition piece of a gas turbine wherein: two protrusions 3, 2 are mounted orthogonally to a main stream of said transition piece on a gas turbine inside diameter side thereof and adjacent to an outlet portion of said transition piece; a plate 4 having a plurality of holes 6 is installed between said two protrusions, said plate having ends fixed to both protrusions (see [0021 of the machine translation]. JP '071 does not teach only one end is fixed/cantilevered and the other end is not fixed nor the elastic seal plate. JP '021 teaches an impingement cover plate 2 (Fig. 5) with holes 4 on the outlet portion of the transition piece which possesses one end which is fixed/cantilevered (left side) and the other end which is not fixed 3'. This lowers the heat transfer rate on the said cover

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plate (see abstract). The seal 3' being an elastic plate is regarded as inherent or present, but untranslated. The plate would even appear to be made of a sheet metal which is inherently elastic. Alternately, in case there is any doubt, it would have been obvious to one of ordinary skill in the art to make the plate 3' elastic, or of a material such as sheet metal which is elastic, in order to better accommodate thermal expansion or facilitate ease of construction. This also enables reduction of thermal stresses. Alternately, JP '328 teaches an impingement cover plate 2 with holes 4 on the outlet portion of the transition piece which possesses one end which is fixed/cantilevered 4 and the other end which is not fixed at 3. For an alternate treatment of the fixed end and other end unfixed, Andersen is applied as a teaching reference which teaches using a perforated cooling plate 38 (see Fig. 1) of a gas turbine component, which is supported on one end by a protrusion 29, 27 by which it is fixed/brazed and the other end of which is freely supported at 32. Not brazing the other end facilitates ease of assembly by reducing the number of brazing operations needed. It would have been obvious to one of ordinary skill in the art to make one end fixed and the other end not fixed of the impingement plate, as taught by any of JP '021, JP '328 and/or in combination with Anderson, in order to lower the heat transfer rate on the impingement plate and/or reduce the thermal stresses and/or for ease of assembly. It would have been obvious to one of ordinary skill in the art to employ the elastic seal plate of JP '021, in order to facilitate reduction in thermal stresses. As for the claim 13, note it is not clear which of the protrusions would be fixed. Note that JP '021 teaches the equivalence in Fig. 6 of making the upstream end fixed vs.

the downstream end in Fig. 4 fixed. It would have been obvious to use the arrangement where the other of said protrusions is provided on a combustion gas upstream side of the one of said protrusions, and the other of said protrusions has a shape of a brim extending toward the gas turbine inside diameter side, as taught by JP '021, in order to employ an equivalent configuration used in the art.

10. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over any of the grounds of rejections as applied to claim 11 above, and further in view of either Enzaki et al (4,695,247) or Nagler et al (6,302,642). The above prior art teaches various aspects of the claimed invention but do not teach the pin is provided to secure a predetermined gap between said transition piece and said impingement-cooling plate. Enzaki et al teach gas turbine impingement plate with a pin 20 is provided to secure a predetermined gap between the piece 15 and said impingement-cooling plate 16. Similarly, Nagler et al teach gas turbine impingement plate with a pin 34, 35 is provided to secure a predetermined gap between the piece 17 and said impingement-cooling plate 36. It would have been obvious to one of ordinary skill in the art to employ a pin to secure a predetermined gap between the transition piece and impingement plate of the above applied prior art, in order to facilitate a stronger connection and/or a consistent gap for impingement cooling air to enter.

11. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP 2003-065071 in view of any of JP 63-080021 of the IDS, JP 62-288328 and/or also in combination with Anderson (4,010,531), as applied above, and further in view of

Wilhelm, Jr. (3,652,181). JP '071 teaches various aspects of the claimed invention including a plurality number of cooling holes 8 made therein from the right/left to the left/right horizontally, viewed in a direction of combustion gas flow but does not disclose whether they are in a central portion only of the said transition piece. Wilhelm, Jr teaches a transition duct with cooling holes 19 in a central portion only of the said transition piece to optimize temperature profile exiting the transition (col. 2, lines 51+). It would have been obvious to one of ordinary skill in the art to employ the cooling holes only in the central portion, to optimize the temperature profile exiting the transition.

12. Claim 9 is rejected under 35 U.S.C. 103(a) as being obvious over any of the art applied above and further in view of Coslow (3,345,494). The JP '071 reference or the JP '021 reference teaches various aspects of the claimed invention but do not teach the end portions confronting relevant transition piece seals have protrusions mounted respectively in a manner that relevant protrusions overlap each other. However, this is a well known construction in the transition duct art, as evidenced by Coslow, who teaches end portions confronting relevant transition piece seals have protrusions 52, 36 mounted respectively in a manner that relevant protrusions overlap each other to reduce the leakage past the seals (col. 2, lines 26+). It would have been obvious to one of ordinary skill in the art to employ the claimed overlapping protrusions, in order to reduce the leakage past the seals.

13. Claim 10 is rejected under 35 U.S.C. 103(a) as being obvious over JP 2003-065071 in view of any of JP 63-080021 of the IDS, JP 62-288328 and/or also in

combination with Anderson (4,010,531), in view of Wilhelm, Jr. (3,652,181), as applied above, and further in view of Coslow (3,345,494). The JP '071 reference teaches various aspects of the claimed invention but do not teach the end portions confronting relevant transition piece seals have protrusions mounted respectively in a manner that relevant protrusions overlap each other. However, this is a well known construction in the transition duct art, as evidenced by Coslow, who teaches end portions confronting relevant transition piece seals have protrusions 52, 36 mounted respectively in a manner that relevant protrusions overlap each other to reduce the leakage past the seals (col. 2, lines 26+). It would have been obvious to one of ordinary skill in the art to employ the claimed overlapping protrusions, in order to reduce the leakage past the seals.

Response to Arguments

14. Applicant's arguments filed 10/19/2007 have been fully considered but they are not persuasive. Applicant's arguments regarding JP '021 are not persuasive arguing Fig. 1 does not show one end being fixed. However the examiner has applied Fig. 6 which clearly shows such an arrangement. JP '021 has an elastic/seal plate 3'. Note that there is minimal structure recited regarding the seal plate and the seal plate 3' performs sealing as the *claimed* structure requires. Furthermore, in the arguments of August 15 2007, applicant appears to have a translation of the JP '021 reference. However, applicant has only produced selected abstracts from that translation and it is impossible to determine

the fair teachings of that reference based on the limited portions cited. Applicant is requested to submit the entire translation of this document for consideration by the USPTO. Furthermore, applicant's analysis on August 15 2007 of the JP '021 reference does not refute the examiner's position of how the structure of JP '021 must be assembled as analyzed previously nor why one of ordinary skill in the art would not assemble the structure in the manner described by the Examiner.

As for applicant's arguments concerning JP '328, the seal plate is on the gas turbine inside diameter side and shows that using only one fixed end for the impingement plate is conventionally known in the art. It is upon combination with the base reference JP '071 that the claim limitations are met. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Contact Information

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Ted Kim whose telephone number is 571-272-4829. The Examiner can be reached on regular business hours before 5:00 pm, Monday to Thursday and every other Friday.

The fax number for the organization where this application is assigned is 571-273-8300.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Devon Kramer, can be reached at 571-272-7118. Alternate inquiries to Technology Center 3700 can be made via 571-272-3700.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). General inquiries can also be directed to the Patents Assistance Center whose telephone number is 800-786-9199. Furthermore, a variety of online resources are available at <http://www.uspto.gov/main/patents.htm>

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